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Chapter X

Meaning construction in remembering: A synthesis of Bartlett and Vygotsky

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SUMMARY

F.C. Bartlett and L.S.Vygotsky were two seminal figures in the psychological study of remembering. Both emphasized the role of meaning and imagination in this process. Bartlett did this by showing the systematic and holistic changes that ensue when cultural material is repeatedly reproduced outside of the group to which it belongs. Vygotsky, on the other hand, attended to the ways in which we construct meaningful "signs" as artificial memory aids to solve memory problems that go beyond our natural capacities. These two approaches are brought together to show how we utilize various cultural resources as tools to imaginatively overcome difficulties in remembering, and in so doing elaborate new meanings. The synthesis is exemplified with an example from research conducted in conversational remembering.

RETHINKING METAPHORS OF MIND AND MEMORY

Science is an activity of constructing general models to describe and explain some phenomena. To do this scientists make use of metaphors: The atom is analogized to the solar system, gas molecules are described as behaving like billiard balls, and sound is visualized as waves in water. In psychology the most prevalent metaphor of mind, since the cognitive revolution, has been that of the computer. Like the computer, the mind is conceptualized as a mechanical processor of information. For example, memory is said to involve three distinct phases of information processing—encoding, storage and retrieval. These three phases are no longer seen as a possible metaphorical description of memory but are rather considered what memory *must* be like. In contrast, Randall (2007) has recently suggested that this computer metaphor be replaced by a compost metaphor with the corresponding 'organic' and interlinked activities of *laying it on*, *breaking it down*, *stirring it up*, and *mixing it in*.

Though the computer metaphor of mind has only been in circulation for a few decades (see Gigerenzer and Goldstein, 1996, for a history), it builds on a much older 'root metaphor'—the mind as storehouse. The earliest form of this root metaphor was put forward by Plato in his *Theaetetus*. There Plato described memories as being like the inscriptions made on wax tabulates, which were used for writing in the ancient world (I imagine this is also the source of Locke's famous metaphor of the *tabula rasa*). Memory and writing were both said to involve making marks on a surface where the writing/memory is stored and later read off/remembered; notice here how writing, storage and reading in this metaphor parallels the three phases of the computer metaphor just described. Since Plato the mind as storehouse (root) metaphor has rarely been questioned in the western tradition.

As psychology moves away from the 'information processing' framework of the first cognitive revolution and begins to instead focus on situated 'acts of meaning' (Bruner, 1990), alternative (root) metaphors will be needed to capture these dynamics of mind. To this end, the present chapter explores Sir Frederic Bartlett's and Lev Vygotsky's theories (and their related metaphors) of memory. Both thinkers offer radical possibilities for rethinking memory as an agentic process taking place outside the head. They also both understood that new conceptions of memory require the innovation of new methods: A purely quantitative analysis is inappropriate to the study of meaning (Michell, 2004) and thus, recent translations of Bartlett and Vygotsky's theories into a form that is easily testable by standard statistical methods test entirely different theories (Danziger, 1985). In this chapter, I will first elucidate Bartlett's and Vygotsky's distinctive approaches to mind and memory and then explore how they might be brought together in a new synthesis.

BARTLETT ON CONSTRUCTIVE REMEMBERING

When Ebbinghaus (1885/1913) inaugurated the psychological study of memory he explicitly used the inscription metaphor. As such he felt justified using meaningless material (i.e. non-sense syllables) that would remain isolated from other material (i.e. not combine into wholes) and could be analyzed by the number of units in a list remembered under a variety of conditions (e.g. time between exposure and recall, order in a series, amount of exposure, etc.). Bartlett found Ebbinghaus's method of non-sense syllables highly artificial and thought it provided us with very little knowledge of how memory operated in everyday life. Contrary to Ebbinghaus's study of the memory, everyday remembering operated on what Bartlett called an "effort after meaning"—that is, striving to connect something given with something other than itself. This phrase already occurs in Bartlett's 1916 *St. John's fellowship dissertation* and continues to be important throughout his career, though less so after *Remembering* (1932). With this conceptualization of remembering (as a holistic and meaningful everyday process), Bartlett goes on to develop a variety of methods congruent with its study.

The method of repeated reproduction, whereby a single subject reproduces a story at increasing time delays (e.g. after twenty minutes, a week, several months), using the Native American story *War of the Ghosts* , was among Bartlett's first and most famous methods. In this experiment, as the story was repeatedly reproduced by Bartlett's subjects it came to look increasingly like a conventional English story–'hunting seals' becomes 'fishing', 'canoes' are changed to 'boats', inexplicable elements are rationalized out of the story and the narrative structure is reorganized. In Bartlett's (1932) words these subjects were 'making the unfamiliar familiar', they were striving to connect this foreign story to something in their own social framework.

Replications of this experiment have tended to see it as a methodologically loose study of 'memory distortion' in need of tightening up with quantitative methods. For example, Roediger *et al.* (2000) divide the story into 42 units and code reproductions for 'accurate', 'minor distortion', 'major distortion' and 'omissions'. They then average together frequencies of these codes for each of their time conditions (fifteen minutes, one week, six months), and find that indeed on average less is remembered over time and a greater percentage of what is remembered is distorted. By attending simply to aggregate statistics these researchers can say nothing about the nature of changes. In contrast, Bartlett's (1932) analysis of qualitative transformations in whole single cases enables him to explore changes of content and meaning.

Bartlett struggled for almost two decades to integrate his experimental findings into a general theory of remembering that provided a radical alternative to Ebbinghaus's (1885/1903) storehouse theory. In contrast to Ebbinghaus's starting point of isolated asocial elements (i.e. traces), Bartlett begins his theorizing with the whole organism actively involved in its environment, using its past to creatively adapt to the present. Thus, Bartlett was not interested in the isolated mental faculty referred to by Ebbinghaus (1885/1903) as "the memory"; instead, he consistently uses the gerund of the verb to emphasize that remember*ing* is a mental *activity* not fundamentally different in kind from imagining and thinking, and thus it should be studied in conjunction with them. Following the philosopher of science Holton (1975), we can say the two thinkers are guided by opposing *themata*: Bartlett (1932) by process, holism and complexity, and Ebbinghaus (1885/1903) by substance, atomism and simplicity. Bartlett's core concepts of *attitudes*, *schema*s and *image*s all serve the purpose of analyzing the complexities of an organism's functional adaptation to its world:

1. *Attitudes* are 'general impressions' largely a matter of feeling. This concept should not to be confused with contemporary psychology's understanding of 'attitudes' as internal evaluations of an object that can be measured on a linear scale. They belong, instead, to the situation as a whole and function to orient the person in it. For example, some of Bartlett's subjects described the *War of the Ghosts* as 'adventurous', 'not English' or 'like I read as a child'. In so doing these subjects set up a holistic way of relating to and remembering the material.
2. *Schemas* were formulated as an extension of Head's (1920) work with brain damaged patients who had lost the ability to coordinate one movement and sensation with the next. These abnormal cases remind us of our own intact ability to holistically organize perception and action, past and present, into a seamless flow. In normally functioning individuals any new movement is both made out of an organized mass of previous movements together with the particular demands of the present context. Bartlett (1932, p. 202) gives an example from tennis, one of his favorite activities: "When I make the stroke I do not… produce something absolutely new, and I never merely repeat something old. The stroke is literally manufactured out of the living visual and postural 'schemata' of the moment and their interrelations". Bartlett (1932) extends the

concept to explain higher mental functions and with them the formation of generalized patterns of cultural activity (i.e. 'conventions').

3. *Images* arise when a *rupture* is produced by two or more conflicting tendencies to action. As such they imply a discontinuity in the stream of action. The function of images is to provide a concrete means by which the person may confidently proceed with one course of action over another in the face of ambiguities. To do this, images *particularize* experience, and in so doing counterbalance the *generalizing* character of schemas. A story, for example, becomes more *generic* when repeatedly reproduced, but some *particular* details of it are still remembered. Luria (1987) has also shown, in his study of the mnemonist Schereshevsky, that limitless powers to use mental images blocks constructive generalization of experience.

These concepts do not yet describe what happens in remembering proper—both attitudes and schemas operate in non-reflective organism-environment relations found in humans and other vertebrates. Remembering occurs when the organism can "turn round upon its own 'schemata' and construct them afresh" (Bartlett 1932, p. 206). When this happens there is a qualitative shift from the non-reflexive habitual flow of action to the self-conscious control of action—in Bartlett's words "not merely something that works the organism but something the organism can work" (p. 208). This conception of remembering puts it in close kinship with thinking, which Bartlett (1958) characterized as "filling in gaps" in information. In both cases there is a turning around on ones schema. The major difference between them is that remembering reconstructs 'the past' through focusing on a single schema and the outstanding details that appear as imagery, whereas thinking fills in gaps in the present information with whatever schemata and imagery are available.

This description of consciousness as taking an attitude outside oneself, shares some features in common with Mead's (1934) theory of the social act, in which I am able take the attitude of another towards my Self because I have previously been in the social position of the other. Mead's (1934) theory goes further than Bartlett's by *explaining* how this process occurs, whereas Bartlett (2008) merely claimed to be *describing* it. Bartlett's theory leaves unresolved the mechanism by which we turn around on our schemata and thus how we escape the continuous flow of embodied action. Danziger (2008, p. 142) articulates this problem well:

> In opposition to the idea of distinct individual memory traces, the concept of the schema had originally been invoked to account for the way in which current and past action and experience are integrated in a seamless flow. But sometimes this flow seems to be interrupted, for instance when images of some distant past interrupt present activity. Is this a 'turning around on one's schemata', as Bartlett suggested? If so, self and schema are separate, and schemata pertain only to objects. But this seems to turn schema theory on its head, because Head's concept had been introduced as a model for a (somatic) self capable of coherent intentional action. Bartlett left the problem hanging and turned to other areas of research.

For these reasons the concept of schema was rejected by Bartlett's students (e.g. Oldfield and Zangwill, 1943). Many years later, however, it was appropriated by American cognitive psychologists to refer to knowledge structures 'in the head', thus altogether avoiding the question of how we 'turn around on our schemata'. Mandler and Johnson (1977), for example, use the concept of "story schema" to show how elements of stories that do not fit into this abstract universal story grammar (i.e. schema) tend to be forgotten. Bartlett does at times seem to imply this notion of schema as mental structure (Norway, 1940) but it stands in opposition to Head's (1920) version of embodied action in an environment, which Bartlett (1932) most explicitly uses as an analogy in his formulation of a theory. Furthermore, schema as *universal* mental structure ignores Bartlett's interest in its sociocultural dimensions, which develops the theories of his anthropologist mentors at Cambridge. Bartlett's experiments clearly show the mediation of English cultural conventions in the remembering of foreign stories, which he understood and devoted much energy to theorize – in fact, he even tried to write a book on 'conventionalization' but stopped after much distress over completing it. At times Bartlett even seems to suggest that schemata are internalizations of these generalized cultural patterns (i.e. conventions), an analogy he takes from his Anthropology mentors at Cambridge. It is this formulation of schemata that I wish to build upon in what follows.

In the next section, Vygotsky's concept of mediation will be explored in search of conceptual tools to develop a more adequate solution to the question of schemata that explains both how we 'turn around on our schema' and how schemata are related to our social world (see also Middleton and Brown, 2005). As we will see, Vygotsky develops a metaphor of the mind as tool user and maker. But this is a special kind of tool, directed at mastering and controlling oneself.

VYGOTSKY ON MEDIATED MEMORY

In many ways Vygotsky's theory of memory is less radical than Bartlett's. Vygotsky never directly questions the adequacy of the inscription metaphor and standardized memory materials such as word lists. His major innovation was to conceptualize remembering as a process of mediation and to develop ways of studying it as such. Vygotsky thought that the impressive advances in memory ability in human history and ontogeny could not easily be accounted for through a purely "natural" process of evolution or biological maturation; instead, one would have to look to the diverse social "technologies" of memory found in societies around the world that mediated memory. Naturally we can remember seven plus or minus two pieces of information at a given time (Miller, 1956); however, with simple memory technologies, such as "chunking" information into meaningful units, the number can be vastly increased. In fact, the modern practice of organizing a book into sections and paragraphs (as with the present paper) is a medieval external memory technology that pre-chunks the book's material for internal memory (Danziger, 2008).

Meaning-making is essential to Vygotsky's theory of mediated memory. Vygotsky and Luria (1930) used the example of tying knots on a rope—a memory technique that was widespread in many pre-literate societies. Making a knot on a rope to remember something gives the knot *meaning*, that is, transforms it from a neutral object into a "sign". The sign has "reverse action," in that it acts back on its creator. Thus, in constructing a "sign" we come to control ourselves from the outside; our activity comes to be mediated through these signs. We do this when we write notes to ourselves in our planner, put an image of a pig on our refrigerator to remind ourselves of our plans to lose weight, or bring back objects from a vacation to remember the trip. The methods developed by Vygotsky were designed to display the process of sign mediation (i.e. meaning-making) and its transformation of psychological operations.

In an experiment conducted by Leontiev, under Vygotsky's guidance, they adopted the standard memory procedure in which a child had to remember a list of words but with a major innovation. Children were given picture cards (in other words, potential 'signs' or 'external mediators) to aid them in recall. They created three experimental conditions for remembering a list of words: (1) standard memory task, (2) task with picture card already conventionally paired with word by the experimenter, and (3) the child is allowed to make their own combinations between words and picture cards. At first they simply compared the scores of children at different ages for mediated (conditions 2 and 3) and unmediated (condition 1) memory, in order to validate Vygotsky's theory of the intertwining of the natural and cultural lines of development.

However, it was Vygotsky's (1987) careful look at the *microgenetic process* by which children used the picture cards in remembering that led him to alter his theory of mediation (Bakhurst, 1990). This process is experimentally triggered by the experimenter by giving the child a task beyond their capacity and providing them with neutral objects that the child can give meaning to (i.e. transform them into external mediators) in order to help them solve the task. The resulting process is produced by the child's own agency, not the experimenter's; the experimenter may *guide* the child toward a particular "means" but cannot *determine* how the child will use them, if they do at all (van der Veer & Valsiner, 1991). Unlike the maximum control of contemporary experiments, which must create easily quantifiable data for statistical comparison, Vygotsky's method profits from the participant's construction of novelty, the active creation of new mean(ing)s to solve a problem.

One might expect children to make links between picture card and target word through strong associations between them, for example using the picture of a 'horse' to remember 'sled'. But children often also made non-obvious links between picture and word. For example, one child used a picture of a crab at the beach to remember 'theatre', explaining "The crab is looking at the stones on the bottom, it is beautiful, it is a theatre" (Vygotsky, 1987, p. 181). Structures, such as these, were created for the first time by the child and could not be explained within the framework of associative psychology—they were more narrative than associative bonds. A more complex explanation would have to be sought that captured the nuances of children's reasoning.

Vygotsky (1987) experimentally isolated three components of the process by which children successfully or unsuccessfully arrived at the target word. These components gradually become integrated in children's development but they can be inferred from young children's errors:

1. *The instrumental component* resembles Vygotsky's original theory of mediation, whereby the child uses a sign in the act of remembering. The child does use the picture card to help them remember but the process is not yet integrated with the operations of imagining, thinking, abstracting, etc. With only this component,

children sometimes create absurd structures, such as "I remember this like a *fish* at a *funeral*" (p.183, my emphasis). Experimenters can facilitate the child's creation of new structures by simply drawing their attention away from the target word to related words or a part of the object itself, and thus providing the scaffolding required for the child to successfully complete the task by opening up meaningful elaboration of the stimulus.

2. *The imaginative component* is the child's (unaided) ability to create their own novel structure, as we saw with the child's narrative connecting "crab" to "theatre". This component may be present while the first is not, in which case the child is unable to use the structure for remembering: the child does not realize that one item can be used to bring to mind the other.

3. *The attention component* is the child's ability to select and direct the mass of emerging images toward the target word, which is placed at the center of the child's attention, as if marked by an X. One child, for example, selected a picture of a lion to remember the verb "to shoot," saying "they shot the lion". However, during recall the child remembered the word "gun" instead of "to shoot" (p. 182). Children without this component could often reproduce the entire structure without arriving at the target word.

Recent research on the development of memory has focused on how adults "scaffold" children's early remembering by providing a *narrative structure* (similar to the imaginative component in Vygotsky's scheme) that the child can use to construct their experiences (Nelson and Fivush, 2005). At first children contribute only small details to the conversation, while adults ask questions and elaborate on children's answers. However, in time children *internalize* adult's questions and their sequence in dialogue, such that children can use them (as tools) to stimulate their own memory without adult guidance. The use of internalized others to remember (in other words, "social frameworks of memory") becomes so automatic that we 'forget' their central place in the process of remembering, believing that we are the sole source of our memories (Halbwachs, 1925). In fact, research shows exactly the opposite: as Vygotsky would have put it, memory develops *from outer to inner*.

This leads us to the conclusion that all voluntary remembering is possible because of some kind of *social suggestion*, whether by actual others or internalized others. At present, suggestion is conceptualized by psychologists as a potentially distorting influence on memories, rather than necessary feature of remembering; the assumption is that the essence of memory is purely internal (i.e. 'in the head'—a storehouse metaphor) but at the same time is vulnerable to the contamination by outside influences. In contrast I want to make the bold claim that memories are organized, accessed and formed by social suggestion performed with social tools, such as language and narrative. In other words, remembering is not simply an internal process but relies on the *mediation* of culture; culture comes to participate in and constitute the process of remembering.

By this I am not implying that literal recall is impossible, but rather that it occurs when the social tools of remembering are adapted to this purpose. Bartlett's (1932) example of this was the prodigious memory of Swazis for cattle, which was an important part of their group's life. An obvious example from our own society are memory aids—such as rhyming poems, acronyms and visualization methods—used to meticulously memorize some material, a practice we are all familiar with from our days of formal schooling. Similar techniques, known as *ars memorativa* (the art or technology of memory), were widespread and held in high esteem in Europe from ancient times through to the sixteen century (Yates, 1966). These tools functioned to help the Greeks and Romans deliver speeches from memory and medieval monks to memorize the content of books, which were in low circulation before the invention of the printing press. The use of memory aids is, however, much more ubiquitous, as Vygotsky's example of the pre-literate accounting practice of tying a knot on a rope shows.

Most of the time, however, life does not require literal recall for details, but instead a generic remembering which allows for flexibility in a changing environment. Luria's (1987) study of the mnemonist Schereshevsky demonstrates that excessive literal recall can actually be highly dysfunctional: Schereshevsky had limitless memory for details (he had to teach himself how to forget things) but lacked the ability to generalize from them, to think of his life as a whole. It is overall beneficial for us that most of our social tools of remembering are *schematic* in kind and operate without self-conscious awareness. They only become visible in contexts like Bartlett's (1932) repeated reproduction experiments, where people are required to remember material to which social tools are ill-adapted, such as to foreign folk stories. In this way, Bartlett's experiments clearly demonstrate the mediation of remembering by cultural conventions.

SYNTHESIS: AN EXPERIMENTAL ILLUSTRATION

I recently collected further evidence for the cultural mediation of remembering in a study that extended Bartlett's repeated reproduction experiment, by having subjects remember *War of the Ghosts* together in conversation rather than alone on paper—a research procedure similar to Middleton & Edwards (1990) and Weldon & Bellinger (1997). One of the most interesting and totally unexpected findings of my research was the persistent occurrence of the idea that the protagonist of *War of the Ghosts* was himself a ghost. Three of my ten pairs of subjects mention it; yet there is nothing in the original story to directly suggest this idea and it does not appear in any of Bartlett's data collected over eighty years ago (nor is it reported in replications of Bartlett's experiment). Why would the idea show up persistently now, but not earlier? An answer presented itself by looking to the wider social-cultural world to which these subjects belonged. Recent Hollywood movies about ghosts (e.g. *The Six Sense* and *The Others*) have developed a narrative template with a surprise ending in which the protagonist realizes that he or she is a ghost. The surprise ending pulls together the separate events of the film into a meaningful whole and thus gives the story *narrative closure.*.

In the Native American society, from which *War of the Ghosts* originates (Boas, 1901), conventions for understanding what happens when one comes into contact with ghosts were readily accessible to anyone and thus no difficulty in remembering the story would occur. English listeners, by contrast, must use their own ill-adapted social tools to mediate their understanding and memory of the folk-story. Reavey and Brown (2009; see also Mori, 2009) aptly describe remembering as a process driven to resolve, or at least temporarily stabilize, discrepancies of meaning (e.g. between individual and collective points of view) to create a unified object in memory. Participants in my experiment used familiar Hollywood ghost narratives as mediators of remembering to resolve the ambiguities and tensions that arise when *War of the Ghosts* is told within a British cultural context. In using these mediators, participants were able to form a meaningful whole in memory out of a story replete with puzzling events, such as why the protagonist "did not feel sick" when he was hit with an arrow and his sudden death when the sun rises at the end of the story. These puzzling events can be explained within a Hollywood narrative template in which the protagonist is actually a ghost throughout the story.

It must be noted that none of my subjects were focally aware that they were using Hollywood ghost films to make sense of the story, though after the experiment they said that they had seen them. It might be argued that subjects were not using these particular films *per se*; but rather schematic narrative mediators that circulated at a broader societal level and were simply objectified in these films, in a manner powerfully described by social representations theory (Moscovici, 2000, 2008). Similarly, in his recent study of Russian collective memory, Wertsch (2002) shows how Russians use the same underlining "schematic narrative template" (i.e. *triumph-over-alien-forces*) to remember various historical events from the Russian civil war to World War II. This narrative template is objectified and carried forward by the various state sponsored textual resources. The concept of "schematic narrative template" (itself developed from Bartlett and Vygotsky's ideas) clearly also provides a way of explaining the persistent addition (of the protagonist being a ghost) in my experiment by connecting individual's unwitting use of cultural resources to their source in society. In short, more than eighty years after Bartlett's experiment I have found subjects mediating their memory for *War of the Ghosts* with new schematic cultural resources, which in turn transform the story in new directions.

CONCLUSION: THE CONSTRUCTION METAPHOR

Let us return to the question of appropriate metaphors to describe memory raised at the beginning of the chapter. We have seen how Bartlett used embodied skill (e.g. playing tennis) and anthropological models of transmission and transformation (e.g. there is an effort to make foreign folk-stories meaningful) as metaphors to orient his study of remembering. On the other hand, Vygotsky's metaphorical sources for understanding memory were tool making and use, and more specifically mnemonic practices (e.g. making knots on a rope). Their ideas can be brought together with the metaphor of "construction", which they both employed. Using this metaphor we can say that remembering is *meaning construction* in reference to the past. The meaning of the past is intimately related to the cultural tools used to represent it. These cultural tools do not simply cue recall for something internal that is already formed (as the inscription metaphor would have it), but instead shape the past into a particular cultural form and in so doing give it meaning. This process is similar to *metaphorical mapping*, whereby a referent (e.g. argument) and metaphorical vehicle (e.g. war) are

conceptually blended together (Lakoff and Johnson, 1980). There is thus a convergence between the use of metaphor as a tool in constructing theories of memory and in constructing memories themselves! In both cases metaphor is used to *represent* something to ourselves to facilitate our action on the world.

Before closing, I want to make a brief methodological point: the study of meaning in remembering is made possible by attending to *single cases and their qualitative transformations* in time. An experimental design devised for statistical analysis would be unable to adequately capture qualitative changes because it relies on counting discrete units at the expense of systemic relationships, which operate at the level of the single case. This is a principle Bartlett and Vygotsky both understood (eighty years ago) but contemporary psychology has been slow to remember.

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